# A SUMMARY OF THE DISTRIBUTION OF THE GENERA OF SOUTH AFRICAN FLOWERING PLANTS.

(With Special Reference to those found in the Divisions of Uitenhage and Port Elizabeth.)

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## Introductory Remarks.

I have often felt the need of a concise account of the distribution of the genera of Phanerogams occurring in South Africa. I felt this need especially when writing an account of the Flora of Uitenhage and Port Elizabeth, which is nearing completion. As such a summary, based on recent data, was not available, there was nothing left but to prepare it myself. It was suggested to me that it might also be of use to other botanists, and I, therefore, offer it for publication.

It has been my endeavour to show as much as possible the general trend of distribution rather than give the exact area of each genus. Moreover, large parts of South Africa are so incompletely known botanically that a more detailed account would in many cases have given a wrong impression. However, where details are given, they may be taken to be as accurate as available records, checked by my own personal knowledge, have enabled me to make them. The treatment of the genera in different families is somewhat uneven. This is due to various causes. In some large orders references to more detailed accounts are readily available, while in others records are very meagre; but, above all, it has been my aim to focus the whole account on the Flora of Port Elizabeth and Uitenhage, which in many cases actually or approximately forms the boundary of genera, while in others it marks the area where the full force of the genera spreading eastwards from the South-West and of others spreading from the East to the West along the southern coast belt is broken. It will be noticed that few genera of fairly general distribution in South Africa are absent from it. Orders and genera not coming near this area were only dealt with for completeness' sake. Some interesting points which have disclosed themselves while preparing this paper will be dealt with in the account of the Flora of Uitenhage and Port Elizabeth, which I hope to be able to submit to the

Society shortly. The arrangement of the orders is in accordance with Engler's system.

With few exceptions, I have abstained from any reference to the occurrence, if any, of our genera outside temperate South Africa, as this can easily be gleaned from the work of Thonner, 'Die Blütenpflanzen Afrikas,' now available in an English translation, and other works of a similar nature, besides works of greater magnitude. I would have preferred to have dealt separately with the genera belonging to different divisions of orders, and it would further have been valuable to have dealt with subgenera and series of species in each genus. Perhaps somebody with more leisure than I can command will take the hint, and give us, at no distant date, a more elaborate account, in which altitudes, ecological zones, geological formations, and similar points are also carefully taken into consideration.

# GYMNOSPERMAE.

## CYCADALES.

### Cycadaceae.

The Uitenhage district is not far from the western limit of the *Cycadaceae* in South Africa. *Stangeria* Th. Moore is endemic from Natal to Tharfield, east of Port Alfred. The only other South African genus, *Encephalartos* Lehm., extends a little west of the Uit. div. A line half-way between the 23rd and 24th degrees of longitude to the neighbourhood of Willowmore is, according to Dr. Rattray, approximately the boundary.

## CONIFERAE.

### Pinaceae.

The only South African genus, *Widdringtonia* Endl., occurs from Clanwilliam along the coast districts to mountains of the eastern parts. Various species of *Pinus* L. have become naturalised in parts of South Africa, *e. g. Pinus Pinaster* on the hills south of Grahamstown.

### Taxaceae.

*Podocarpus* L'Hér., found from Clanwilliam and the Cape Peninsula through all the forests of the southern coast belt to the East and North-east.

## GNETALES.

### Gnetaceae.

Represented in South Africa by *Welwitschia* Hook. f. Only found in the western Arid part of Great Namaqualand and northwards to Angola.

# ANGIOSPERMAE.

## MONOCOTYLEDONEAE.

### PANDANALES.

**Typhaceae.**

The genus *Typha* L. has not been recorded in the southern coast belt from localities west of Van Stadens. It is found, however, in the Karroo and in the eastern and north-eastern parts.

### HELOBIAE.

**Hydrocharitaceae.**

This order is represented in South Africa only by one species of *Lagarosiphon* Harv. It has its western limits at the Gamtoos River, and extends to Natal and the Transvaal.

**Potamogetonaceae.**

It is curious that out of five species recorded of *Potamogeton* L. in the Uit. and P. E. div. four have not been collected recently. This may be due to insufficient attention having been paid to them, possibly also to drainage of places where previously conditions for their growth were more favourable. *Zostera* L. occurs in the tidal portion of the Zwartkops River (also recorded from the Kleinriver Vley and from Natal). *Ruppia* L. is only recorded from the Cape div. and *Zannichellia* L. from western and northern parts.

**Naiadaceae.**

*Naias* L. is recorded from the Transvaal only.

**Aponogetaceae.**

*Aponogeton* Thunb. extends from north-eastern and eastern parts, mainly through the coast districts to the Cape div., but also into the central parts to the Somerset East and Richmond divs.

**Scheuchzeriaceae.**

*Triglochin* L. is found in the coast belt from the Cape Peninsula to Natal, going inland to the Paarl and Griqualand East.

### GLUMIFLORAE.

**Gramineae.**

Without taking into account obviously introduced genera almost all genera of more or less general distribution are recorded from the Uit. and P. E. divs. Exceptions are *Anthoxanthum* L. (the species of which have

either a decided eastern or decided western distribution), *Imperata* Cyr., and *Enneavogon* Desv. (recorded in the south-west coast region only from the Knysna). Of the genera of decidedly south-western distribution the following are absent: *Prionanthium* Desv., *Pentameris* Beauv., *Chaetobromus* Nees, *Poagrostis* Stapf, *Trisetum* Pers., *Urochlaena* Nees, while *Brizopyrum* Nees, and *Scleropoa* Griseb. have near Port Elizabeth their eastern limit, and *Aira* L., *Avenastrum* Juss., *Ehrharta* Thunb., *Lasiochloa* Kth., *Vulpia* Gmel. extend still further east. (*Aira* and *Ehrharta* are found also on the mountains of Tropical Africa.) *Atropis angusta* Stapf, which the author thinks has come from "saline places by the Zwartkops River" has not been found by recent collectors. Of the genera which are entirely or mainly Central the following are absent: *Brachypodium* Beauv., *Arundinaria* Mich., *Tetrachne* Nees, *Oropetium* Trin., *Secale* L. There are about twenty-three genera in South Africa which have an exclusively eastern distribution (some extending into the Kalahari region). These are absent with the exception of *Elionurus* Humb. et Bonpl. (reaching its western limit at the Zwartkops R.), *Oplismenus* L. (western limit Springfields, near Uitenhage), *Chloris* Sw. (distribution west of Uitenhage insignificant).

**Cyperaceae.**

On the whole the delimitation of genera by C. B. Clarke in the 'Flora Capensis' has been followed, though here and there it is very unsatisfactory. Thus *Pycreus* Beauv. is not sharply divided from *Cyperus* Linn., *Fimbristylis* Vahl, and *Bulbostylis* Kunth grade into one another, and *Scirpus* Linn. and *Ficinia* Schrad. should be united.

(*a*) Fairly generally distributed (all represented in the Uit. and P. E. divs.):

*Kyllinga* Rottb., *Pycreus* Beauv., *Cyperus* L., *Fimbristylis* Vahl, *Scirpus* L., *Carex* L. The following are absent from the western region and western parts of central region: *Mariscus* Gaertn., *Eleocharis* R. Br., *Bulbostylis* Kunth, *Ficinia* Schrad., *Fuirena* Rottb., *Schoenoxiphium* Nees.

(*b*) Mainly northern and north-eastern:

*Lipocarpha* R. Br., *Rhynchospora* Vahl (also found at Grahamstown and on Table Mountain), *Costularia* C.B.Cl., *Cladium* R. Br. (also at Van Stadens and Krakakamma), *Scleria* Berg. (extends to Komgha division), *Eriophorum* L., and *Eriospora* A. Rich. (Transvaal only).

(*c*) Mainly or entirely in the south-west

*Carpha* R. Br. (extends to Somerset East and Pondoland), *Ecklonea* Steud. (Cape Peninsula and Bains Kloof), *Epischoenus* C.B.Cl. (Cape Peninsula to Riversdale), *Tetraria* Beauv. (extends to Somerset East

and Pondoland), *Macrochaetium* Steud. (Swellendam to Van Stadens), *Chrysithrix* L. (Cape Peninsula to Riversdale).

There remains *Schoenus* L. recorded from the southern coast districts to Komgha and also from Griqualand West, but not from the Uitenhage and Port Elizabeth divisions.

## PRINCIPES.

### Palmae.

There are only three genera of palms found in the south-eastern coast strip. *Hyphaene* Gaertn. does not go south of Natal, *Jubaeapsis* Becc. is found in Pondoland. *Phoenix* L. extends to the east bank of the mouth of the Bushmansriver, thus coming near the P. E. div.

## SPATHIFLORAE.

### Aroideae.

The two tropical genera, *Stylochiton* Lepr. and *Ptisai* L. extend to Natal. *Zantedeschia* Spreng. (*Richardia* Kunth) has chiefly north-eastern and eastern distribution, extending to Aliwal North and in the coast belt to the Cape Peninsula.

### Lemnaceae.

It is somewhat strange that this order is not recorded west of Port Elizabeth. Both *Lemna* L. and *Wolffia* Hook. are found in the coast belt from there to the Tropics.

## FARINOSAE.

### Flagellariaceae.

*Flagellaria* L. extends from the Tropics in the coast districts to East London.

### Restiaceae.

There are many more *Restiaceae* found in the Uitenhage and Port Elizabeth divisions than are recorded in the 'Flora Capensis.' Most of them are found either in the hills bordering the districts on the west or close to the sea. In the Albany and Bathurst districts only eight species have been found, whereas here we have about twenty-five. In Natal *Restio* L. and *Leptocarpus* R. Br. are represented by one species. It is a well-known fact that the large majority of the South African *Restiaceae* are confined to the South-west. The following genera are absent from the Uitenhage and Port Elizabeth divisions: *Askidiospermum* Steud., *Willdenovia* Thunb., *Ceratocarzum* Nees, *Anthochortus* Nees, *Phyllocomos* Mast.

### Xyridaceae.

*Xyris* L. has mainly north-eastern and eastern distribution, extending to Somerset East and Kingwilliamstown. One species appears to have a

disjointed distribution, being also found on the Cape Peninsula and in the Tulbagh division.

**Eriocaulaceae.**

*Eriococaulon* L. is found in eastern and north-eastern parts, extending to Kingwilliamstown. *Mesanthemum* Koern. only just crosses the Tropics, while *Paspalanthus* Mast. is recorded from various places in the Transvaal.

**Commelinaceae.**

*Aneilema* R. Br. is found in eastern and north-eastern parts to Pondoland. *Coleotrype* R. Br. and *Floscopa* Lour. are recorded from Natal. *Commelina* L. and *Cyanotis* D. Don are absent from the western region and the western part of the central region. The latter does not reach the Cape Peninsula.

**Pontederiaceae.**

Only one species of *Heteranthera* Ruiz et Pavon is recorded from the Transvaal Bushveldt.

## LILIIFLORAE.

**Liliaceae.**

*A*. Genera extending more or less into Tropical Africa:

(*a*) More or less generally distributed in South Africa (all found in the Uit. and P. E. divs.):

*Asparagus* L., *Bulbine* L., *Eriospermum* Jacq., *Chlorophytum* Ker, *Anthericum* L., *Tulbaghia* Linn., *Drimia* Jacq., *Dipcadi* Medic., *Albuca* L., *Urginea* Steinh., *Ornithogalum* Linn., *Androcymbium* Willd.

(*b*) Mainly or only in the east and north-east:

*Smilax* L. (to Natal), *Kniphofia* Moench. (to Aliwal North and Uitenhage, one species on the Cape Peninsula), *Dracaena* L. (in the coast districts to Uitenhage), *Sansevieria* Thunb. (to Graaff Reinet and Uit. div.), *Notosceptrum* Kunth. (Transvaal and Natal), *Schizobasis* Bak. (extends to Hopetown and Somerset East, not to Natal), *Eucomis* L'Her. (to Graaff Reinet and Uit. div.), *Scilla* L. to Uit. and Somerset divs.), *Drimiopsis* L. (to East London), *Iphigenia* Kunth. (parts bordering on Tropics to Witbank, Transvaal, not in Natal), *Gloriosa* L. (on the coast as far as Port Alfred), *Littonia* Hook. f. (to Orange Free State and the Bashee), *Walleria* Kirk (Transvaal only).

(*c*) Mainly or only in S.W. coast region:

*Hyacinthus* L. (only Cape Peninsula, Cape Flats, and at Tulbagh), *Caesia* R. Br. (eastwards to Uit. div.), *Ornithoglossum* Salisb. (extends through central region to Uit. div., Cradock, and Bechuanaland), *Wurmbea* Thunb. (extends to Port Elizabeth and in the mountains from Somerset East to Natal).

(*d*) Mainly in central regions:

*Haworthia* Duval (radiates in all directions, but not reaching the Cape Peninsula nor Natal).

*B.* Genera endemic in South Africa (*Daubenya* Lindl., locality unrecorded):

(*a*) Eastern and north-eastern:

*Behnia* Didr. and *Agapanthus* L'Her. (westwards to Somerset East and Uit. div.), *Galtonia* Dcne. (to the Transkei and Aliwal North), *Litanthus* Hook. f. (from the Transvaal and Swaziland to Somerset East and Uit. div., but not recorded from Natal), *Bowiea* Harv. (to Katberg), *Sandersonia* Hook. f. (Pondoland, Griqualand East, Natal).

(*b*) Southern coast districts:

*Veltheimia* Gled. (Little Namaqualand to Kaffraria), *Nanolirion* Benth. (Tulbagh div. only), *Chamaealoe* Berg. (Uit. div.), *Neodregea* C. H. Wright (P. E. and Grahamstown), *Neopatersonia* Schönl. (Uit. div.), *Lachenalia* Macq. (mainly S.W., extending to western and central regions, one in the Transkei), *Dipidax* Salisb. (S.W. to Port Elizabeth), *Baeometra* Salisb. (S.W. to Riversdale).

(*c*) Mainly in central districts and extending in various directions (all in Uit. div.):

*Massonia* Thunb., *Polyxena* Kunth., *Gasteria* Duv., *Apicra* Willd. (none reaching the Cape Peninsula nor Natal with the exception of *Gasteria*, which is found in Natal). *Apicra* Willd. is not recorded from the Uit. and P. E. divs.

(*d*) Mainly western:

*Whiteheadia* Harv. (Namaqualand and south of Graaff Reinet), *Pseudogaltonia* O.K. (Great Namaqualand).

There remain only *Bulbinella* Kunth. with fairly general distribution in South Africa, though not found on the Cape Peninsula (absent from Tropical Africa, but found in New Zealand and the Campbell and Auckland Islands), *Rhadamanthus* Salisb. with rather erratic distribution (one in western Karroo, one near Grahamstown and East London, one doubtfully belonging to the genus at Komgha).

**Juncaceae.**

*Juncus* L. is found in all South African regions, but the number of species is particularly large (twelve) in the Uitenhage and Port Elizabeth divisions. The south-western genus *Prionium* E. Mey. is found still a little further east; the third genus *Luzula* Dc. has only been found on the Katberg, at Cathcart, and on the Mont aux Sources.

**Haemodoraceae.**

*Barberetta* Harv. is only known from Natal and the Transkei. The south-western genus *Dilatris* Berg. extends to the Riversdale division. *Wachendorfia* L. has its eastern limit in the Uitenhage district, while *Lanaria* Ait. extends to the east of Port Alfred, as does also *Cyanella* L. As regards *Pauridia* (placed by some under *Haemodoraceae*), see under *Amaryllidaceae.*

**Amaryllidaceae.**

The number of genera of *Amaryllidaceae* endemic in South Africa exceeds the number of those also found beyond its boundaries. All genera of fairly general distribution are found in the Uit. and P. E. divs.

(*a*) Fairly generally distributed:

*Brunsvigia* Heist., *Crinum* L. (the species are mainly eastern). *Hypoxis* L. (absent in central parts except towards the East), *Forbesia* Eckl. (*Curculigo* Gaertn.), *Nerine* Herb. and *Ammocharis* Herb. (both extend to Damaraland).

(*b*) Mainly western and south-western, all endemic:

*Pauridia* Harv. (to Humansdorp), *Ianthe* Salisb. (to Grahamstown), *Hessea* Herb. (to Uitenhage, Graaff Reinet and Hopetown), *Carpolyza* Salisb. (Cape Peninsula only), *Strumaria* Jacq. (extends to Uitenhage and into central parts, not on Cape Peninsula), *Amaryllis* L. (S.W. only), *Gethyllis* L. (to Uitenhage and Graaff Reinet), *Vallota* Bak. (neighbourhood of George only).

(*c*) Mainly eastern and north-eastern (see also *Crinum* L. above):

*Buphane* Herb. and *Haemanthus* L. (both to Graaff Reinet and in the coast belt to Malmesbury), *Cyrtanthus* Ait. (in the coast belt to Caledon) and the following endemic genera: *Clivia* L. (to south of Grahamstown), *Apodolirion* Bak (to Graaff Reinet and Uitenhage), *Anoiganthus* Bak. (Swaziland to East London and Somerset East), *Rhodohypoxis* Nel. (Griqualand East and Natal).

**Velloziaceae.**

*Barbacenia* Vaud. (*Vellozia* Vaud.) is only found in north-eastern and eastern parts to Griqualand East and Pondoland.

**Dioscoreaceae.**

*Dioscorea* L. and *Testudinaria* Salisb. have mainly north-eastern and eastern distribution. The first extends in the coast belt to George; the second, which is endemic, to Somerset East and Humansdorp. The distribution of *Dioscorea* in the southern parts is very erratic. There is one species growing at Kamaehs, near Uitenhage.

**Iridaceae.**

There are a remarkable number of genera endemic in South Africa. Of these only *Homeria* Vent. is fairly generally distributed. *Babiana* Ker is found in South Africa and the island of Socotra, *Geissorrhiza* Ker in South Africa and Madagascar, *Watsonia* Mill. in South Africa, Madagascar, and the Mascarene Islands. (See also *Ferraria* and *Romulea*.)

(*a*) Fairly generally distributed:

*Moraea* L., *Homeria* Vent. (absent from the greater part of the central region and the western region), *Aristea* Ait., *Hesperantha* Ker., *Lapeyrousia* Pouvr. (not recorded from the Uit. and P. E. divs., but in Bathurst div.), *Watsonia* Mill. and *Acidanthera* Hochst. (absent from the central and western parts), *Tritonia* Ker, *Gladiolus* L. (absent from the greater part of the central region), *Antholyza* L. (absent from central and western region).

(*b*) Mainly or entirely south-western:

*Ferraria* L. (to Uit. div., one species at Victoria West, the only genus of this group besides *Romulea* Maratti extending to Tropical Africa), *Galaxia* Thunb. (not reaching Uit. div.), *Bobartia* Ker. (to East London), *Witsenia* Vent. (to Swellendam), *Cleanthe* Salisb. (only recorded from the Paarl and Paardeberg), *Nivenia* Vent. (Caledon to Oudtshoorn), *Klattia* Bak. (Swellendam and Riversdale), *Geissorrhiza* Ker and *Ixia* L. (to Griqualand East and Natal?), *Pillansia* L. Bol. (only in Palmiet River mountains), *Streptanthera* Sw. (only recorded from Tulbagh), *Micranthus* Pers. (to Uit. div.), *Freesia* Klatt (Swellendam to Grahamstown), *Melasphaerula* Ker (to Uit. div.), *Sparaxis* Ker (to Uit. div.), *Synnotia* Sw. (Clanwilliam to Cape Peninsula), *Romulea* Mar. (to Grahamstown, but again in various parts of Tropical Africa and in the Mediterranean region).

(*c*) Mainly central and western:

*Syringodea* Hook. f. (endemic, recorded from Uit. div.).

(*d*) Mainly or entirely eastern:

*Schizostylis* Backh. et Harv. (endemic, to Stockenstroom division), *Dierama* K. Koch (to Somerset East and Humansdorp div.), *Crocosmia* Planch. (to Tembuland).—(*Keitia* Reg., supposed to come from Natal, is probably not of South African origin.)

## SCITAMINEAE.

**Musaceae.**

A native species of *Musa* L. is found in the Northern Transvaal. *Strelitzia* L. is endemic and occurs from the Knysna district to Natal. At both extreme points of distribution only *S. augusta* occurs, whereas *S. Reginae*

is found from Humansdorp to Pondoland. One species appears to be confined to the Uit. div.

**Cannaceae.**

*Canna indica* has become naturalised in the Van Stadens Pass.

**Zingiberaceae.**

*Kaempferia* L. (including *Siphonochilus* Wood et Franks) extends into Zululand and Natal.

## MICROSPERMAE.

**Burmanniaceae.**

*Burmannia*, L. only just reaches temperate South Africa in the north-east at Inhambane.

**Orchidaceae.**

Few genera are represented in the Western Region and few enter the Central Region in its eastern and western parts. There are a number of endemic genera of which only one is restricted to the north-eastern and eastern parts, namely *Huttonaea* Harv. (Transvaal, Natal to Transkei). Most of the endemic genera are entirely or mainly found in the south-west: *Acrolophia* Pfitz. (extends to Somerset East div. and Komgha), *Bartholina* R. Br. (from Cape Peninsula to Grahamstown), *Satyridium* Lindl. (Cape, Caledon, and Worcester divs.), *Aviceps*, Lindl. (South-west and Little Namaqualand, not on Cape Peninsula), *Pachites* Lindl. (Cape Peninsula to Riversdale), *Orthopenthea* Rolfe (Clanwilliam div. to Humansdorp div., Ceres div.), *Monadenia* Lindl. (Little Namaqualand, South-west to Natal and the Transvaal), *Amphigena* (Cape and Caledon divs.), *Forficaria* Lindl. (Worcester, Stellenbosch, and Knysna divs.), *Penthea* Lindl. (Clanwilliam to George, one species also on the Zuurberg in the Alexandria div., and in Natal), *Schizodium* Lindl. (South-west to Port Elizabeth, also in Van Rhynsdorp div.), *Ceratandra* Rolfe (Clanwilliam div. to the Knysna), *Ceratandropsis* Rolfe (Clanwilliam div. to Grahamstown), *Evota* Rolfe (Piquetberg, Tulbagh, Cape, Worcester, and Ceres divs.), *Ommatodium* Lindl. (Little Namaqualand, Clanwilliam to Swellendam), *Anochilus* Rolfe (Little Namaqualand, South-west, but not on Cape Peninsula, one species in the Molteno div.), *Corycium* Sw. (Coast belt from Little Namaqualand through Clanwilliam to the East and North-east, one species in the Ceres div., two in the Cradock div.). Amongst the genera which are also found in Tropical Africa, there are:

(1) Some with very restricted distribution: *Corymbis* Thouars (Pondoland), *Zeuxine* Lindl., *Platylepsis* A. Rich., *Peristylus* Blume and *Cynorchis* Thouars (Natal), *Pogonia* Juss. (Transvaal).

(2) A number with more or less extended distribution in north-eastern and eastern parts (many going westwards in the coast belt) :

(*a*) Not beyond the Kei River :

*Megaclinum*, Lindl. (to Pondoland), *Ansellia* Lindl. (to Natal).

(*b*) Not beyond the Uit. div. :

*Calanthe* R. Br. (to Pirie Forest), *Lissochilus* R. Br. (to Somerset East and Uit. divs.), *Brachycorythis* Lindl. (to Bedford div., absent from the Albany and Bathurst divs.), *Schizochilus* Sond. (to Fort Beaufort div., absent from the Albany and Bathurst divs.), *Stenoglottis* Lindl. (to Grahamstown).

(*c*) Not beyond the Swellendam div. :

*Polystachya* Hook. (to the Knysna), *Angraecum* Bory (to Somerset East and Swellendam divs.), *Listrostachys* Reichb. f. (to Somerset East and the Knysna), *Mystacidium* Lindl. (to the Bedford div. and the Knysna), *Platanthera* L. C. Rich. (one species in Natal and the Transvaal and two from Grahamstown to Riversdale), *Habenaria* Willd. (to Somerset East and Swellendam divs.), *Brownleea* Harv. (to George div.).

(*d*) Not beyond the Clanwilliam div. :

*Liparis* L. C. Rich. (to Cape Peninsula), *Eulophia* R. Br. (to Aliwal North, Bedford, and along the coast belt to Clanwilliam div.), *Bonatea* Willd. (to Somerset East div. and Malmesbury div., not on Cape Peninsula), *Satyrium* Sw. (to Cradock, Somerset East, Malmesbury, and Piquetberg divs.), *Herschelia* Lindl. (almost restricted to temperate South Africa, one species in Tembuland and the Transvaal, Somerset East div., and from Grahamstown to George, but mainly south-western to Clanwilliam, one on Zwarteberg Pass near Prince Albert), *Disa* Berg. (mainly South African to Somerset East div. and in the coast belt to Clanwilliam div., but also in Calvinia and Ceres divs.), *Pterygodium* Sw. (almost restricted to temperate South Africa, to Transkei and then again from Grahamstown to the Clanwilliam div., also in the Ceres div.), *Disperis* Sw. (to Somerset East and along the coast belt to Clanwilliam div., also in the Ceres div.).

# DICOTYLEDONEAE.

## ARCHICHLAMYDEAE

## (Choripetalae and Apetalae).

### PIPERALES.

**Piperaceae.**

The only well known species of *Piper* L. is found in the Swellendam div.,

the Knysna div., Pondoland, Natal, and the Transvaal. *Peperomia* Ruiz et Pavon has mainly eastern and north-eastern distribution extending to Somerset East and in the coast belt to the Cape Peninsula.

## SALICALES.

### Salicaceae.

Only *Salix* L. is found in South Africa, represented in the Uit. and P. E. divs. by a widely distributed species. Two other species are found in the Transvaal and Natal respectively.

## MYRICALES.

### Myricaceae.

*Myrica* L. is widely spread in the southern coast districts of South Africa.

## URTIALES.

### Ulmaceae.

The South African genera are chiefly of eastern or north-eastern distribution. *Celtis* L., represented by only one species, extends to Graaff Reinet and in the forests of the southern coast belt to the Cape Peninsula. *Trema* Lour. (*Sponia* Comm.) extends to Kentani and *Chaetacme* Planch. to Grahamstown.

### Moraceae.

*Ficus* L. is the only genus native in South Africa. It radiates from the Tropics to the mountains and the eastern borders of the Central Region, and in the coast belt to the west of the Uitenhage div., but does not reach the Cape Peninsula.

### Urticaceae.

Most South African genera radiate from the Tropics through the north-eastern and eastern parts, only one native species of *Urtica* L. reaching the Uit. and P. E. divs. (not the Cape Peninsula).

*Australina* Gaud. extends to the Cape Peninsula. *Urera* Gaud. extends to Komgha; *Fleurya* Gaud. to Somerset East, Grahamstown and Port Alfred; *Pouzolzia* Gaud. to Komati Poort and P. P. rust and Natal.

*Forskohlia* L. extends from Damaraland through Bushmanland to Graaff Reinet. I have no South African record of *Droguetia* Gaud., which Thonner states is found in South Africa.

## PROTEALES.

### Proteaceae.

To anybody acquainted with the general distribution of *Proteaceae* in South Africa it will not be surprising that out of fourteen genera in the 'Flora Capensis' only four are recorded in the Uit. and P. E. divs. *Paranomus*, Salisb. et Knight (*Nivenia* R.Br.) finds its eastern limit at

Vanstadens, where most of the recorded species of other genera also occur. *Leucadendron adscendens* R. Br. extends to Grahamstown, while *Leucospermum* R. Br. in one species only (*L. attenuatum* R. Br.) extends to Gazaland, and *Protea* L. has a wide eastern distribution, though with only few species. Some of the forests in our districts will probably be found to include a representative of the genus *Faurea* Harv., which occurs at the Knysna and then again further east from the Transkei onwards. Sim records it on the authority of Mr. McNaughton from Zitzikamma. *Hakea* Schrad, is naturalised near Grahamstown.

## SANTALALES.

### Santalaceae.

All genera of South African *Santalaceae* are represented in the Uit. and P. E. divs. (for the genus *Grubbia* see *Grubbiaceae*). The genus *Thesidium*, which, on the whole, is of south-western distribution, extends eastwards only as far as the neighbourhood of Grahamstown. The distribution of the other four genera is much wider and does not call for any remarks. They are *Thesium* L., *Colpoon* Berg. (*Rhoiocarpus* A. DC.—endemic), *Osyris* L., *Osyridicarpus*, A. DC.

### Grubbiaceae (endemic in S.W. Cape Colony).

The only genus, *Grubbia* Berg., is found from Clanwilliam to George. In the 'Flora Capensis,' xi, p. 327, Sonder also records *Grubbia stricta* DC. from mountains in the district of Uitenhage. It has not been found so far east in recent years.

### Olacaceae.

*Ximenia* Plum. is recorded from Natal.

### Loranthaceae.

As far as I know, the genus *Loranthus* L. finds its western limit as regards the southern coast districts in the Uit. div., radiating, like so many other South African genera, from Tropical Africa, and penetrating from the north to Namaqualand and Clanwilliam. The genus *Viscum* L. has a more general distribution, our districts yield the most interesting *Viscum minimum* Harv. and *V. crassulae* E. & Z. both extending, however, to the neighbourhood of Grahamstown.

### Balanophoraceae.

Of the two South African genera, *Mystropetalon* Harv. is of south-western distribution (from the Caledon district to near Sir Lowry's Pass), while *Sarcophyte sanguinea*, being fairly common in the Albany district, is sure to be found near Uitenhage, though not recorded.

## ARISTOLOCHIALES.

### Aristolochiaceae.

One species of *Aristolochia* L. is found in the Northern Transvaal.

### Rafflesiaceae.

The occurrence of *Cytinus dioicus* Juss. at Port Elizabeth marks the eastern limit of the genus in the coast districts of South Africa. Westwards it extends to Saldanha Bay. According to Marloth it extends eastwards to Kaffraria, but no locality beyond that mentioned is known to me.

### Hydnoraceae.

The wide distribution of *Hydnora africana* Thunb. which is found both west and east (as far as Kingwilliamstown) of Uitenhage, makes it practically certain that it will also be found in our districts, though hitherto unrecorded. *Hydnora* is perhaps unique amongst South African genera, extending so far in the southern coast belt by passing through the western region into the Tropics.

## POLYGONALES.

### Polygonaceae.

The genus *Oxygonum* Burch. is absent from the Uit. and P. E. divs., but (leaving out a Stellenbosch record in the 'Flora Capensis' which I consider as doubtful) it is only found in the Kalahari region, Natal and Great Namaqualand. The three other South African genera are generally distributed.

## CENTROSPERMAE.

### Chenopodiaceae.

The genera *Roubieva* Moquin, *Kochia* Roth., and *Salsola* L. are not recorded from the Uit. and P. E. divs. The first is only represented in South Africa by an introduced weed; the second is only found in the Karroo region; the third is found also in the Karroo region, but extends to the Kalahari region, and one species was found by Zeyher at Sidbury, near Grahamstown. The other South African genera have fairly general distribution, and are found in the Uit. and P. E. divs.

### Amarantaceae.

Very few species of this order are found west of Uitenhage in the coast districts, while they increase in number towards the East and in the northern districts of Cape Colony. *Cyathula* Lour., *Pupalia* Juss., *Achyropsis* Hook. f., *Alternanthera* Forsk., and *Gomphrena* L. are not recorded west of Uitenhage, but as they are weeds they may have been neglected by collectors.

### Nyctaginaceae.

Extending from the Tropics into South Africa, only *Phaeoptilum* Radlk.,

having a disjointed distribution, as, in South Africa, it is only known from the Calvinia div. *Pisonia* L. is found in Natal. *Boerhaavia* Vaill. extends to Barkly West, Hopetown and Queenstown. *Mirabilis* L. is introduced in Natal.

**Phytolaccaceae.**

*Adenogramma* Reichb., *Limeum* L., *Psammotropha* E. & Z., and *Phytolacca* L. are represented in the Uit. and P. E. divs. *Adenogramma* and *Limeum* have fairly general distribution ; the former (endemic) appears to be absent from the central region. *Psammotropha* has mainly western and central distribution, but extends to the Drakensberg in Natal. *Phytolacca* penetrates from the Tropics and reaches Graaff Reinet and the Cape Peninsula. There remain *Microtea* Sw. (Kalahari region to Little Namaqualand), *Giesekia* L. (North and North-east to Graaff Reinet, also in Bushmanland) and *Polpoda* Presl (endemic, restricted to Cape Peninsula).

**Aizoaceae.**

In the Uit. and P. E. divs. only *Orygia* Forsk., *Hypertelis* E. Mey., *Pharnaceum* L., *Tetragonia* L., *Aizoon* L., *Galenia* L., and *Mesembrianthemum* L. are represented, the last by a large number of species. East of our districts their number is considerably reduced. All these genera are fairly generally distributed in South Africa. *Hypertelis* (endemic) is absent in Natal. *Mollugo* L. has also fairly general distribution, but does not occur on the Cape Peninsula and in the southern coast belt. *Glinus* L. is found in parts adjoining the Tropics and at George. *Sesuvium* L. is found in the West. The remaining genera are endemic : *Anisostigma* Schinz (Great Namaqualand), *Trianthema* L. (Western), *Plinthus* Fenzl (Central), *Coelanthium* E. Mey. (West and South-west), *Acrosanthes* E. & Z. (South-west). (See also *Phytolaccaceae*.)

**Portulacaceae.**

The genera *Talinum* Adans. (East, North, and North-west) and *Ceraria* Pears. et Stephens (Namaqualand) are absent in the Uit. and P. E. divs. *Anacampseros* Sims, like *Portulacaria* Jacq., a typical Karroo genus, is only represented by species belonging to the section *Telephiastrum* Dill., while *Portulacaria* Jacq. is common in karroid parts of the Uit. div., and mingles even with eastern types.

**Basellaceae.**

*Boussaingaultia baselloides* has become a weed in hedges, etc., in the Uit. and P. E. divs., as in many other parts of South Africa.

**Caryophyllaceae.**

The genera *Drymaria* Willd. and *Polycarpaea* Lam. with eastern distribu-

tion do not come near the districts of Uit. and P. E. The other native genera belonging to *Alsinoideae* and *Silenoideae*, which are all widely spread, are recorded. Amongst those with indehiscent fruits only *Scleranthus* L. has not been recorded from the Uit. and P. E. divs., but is sure to be found there. *Pollichia* Soland. occurs in the North and North-east, but not in the central, western, and south-western parts. The Uit. div. appears to be its western boundary. *Herniaria* L. is found in the southern coast belt, the east part of the central region and in northern parts. *Corrigiola* L. occurs in the north-eastern and eastern parts, extending in the southern coast belt to the Cape Peninsula. *Scleranthus* L. is recorded from the southern coast belt and Graaff Reinet.

## RANALES.

### Nymphaeaceae.

The widely-spread *Nymphaea capensis* Thunb. is not uncommon in the Uit. and P. E. divs.

### Ceratophyllaceae.

A species of *Ceratophyllum* L. is recorded from Natal.

### Ranunculaceae.

*Anemone* L. and *Thalictrum* L. have not been found in the Uit. and P. E. divs. The former has a very disjointed distribution in South Africa, the latter is only found east of the Katberg. *Ranunculus aquatilis* L., though not recorded, may be expected to occur in the districts. *R. pubescens* Thunb. is common. *Clematis* L. and *Knowltonia* Salisb., both widely spread in the southern coast belt, extending to the Transvaal, are common in our area.

### Menispermaceae.

*Antizoma* Miers (including *Cissampelos capensis* L.f.) is endemic or just crosses into the Tropics in the West. It is represented in all parts of temperate South Africa, except perhaps in the central part of the central region. The other genera extend from the Tropics: *Cocculus* DC., *Triclisia* Benth., and *Epinetrum* Hiern (*Synclisia* Benth.) to Delagoa Bay, *Desmonema* Miers and *Jatrorrhiza* Miers to Natal, *Stephania* Lour. to the Orange Free State and Griqualand East, *Cissampelos* L. to the George div.

### Anonaceae.

Only few genera enter from the Tropics along the eastern coast belt. *Popowia* Endl. reaches the neighbourhood of East London, *Anona* L., *Artabotrys* R. Br., and *Uvaria* L. Natal, *Monodora* Dun. Delagoa Bay.

**Monimiaceae.**

*Xymalos* Baill. extends from the Tropics into eastern and north-eastern South Africa as far as the Pirie forest near Kingwilliamstown.

**Lauraceae.**

The genera *Cryptocarya* R. Br. and *Ocotea* Aubl. have a distribution paralleled to a certain extent by that of *Faurea*, there being a more or less wide gap in their distribution in the coast districts; *Ocotea* extends to the Cape Peninsula. Both may be found yet just to reach the Uit. div. in the West. The only species of *Cassytha* recorded extends from the Paarl to Grahamstown. Other species occur much further east.

## RHOEADALES.

**Papaveraceae.**

*Papaver* L. (introduced?) and *Argemone* L. (introduced) are each represented in the Uit. and P. E. divs. by one species widely spread in South Africa. *Corydalis* DC. (incl. *Cysticapnos* Adans. [S.W.] ) has several native species, of which only one is recorded. *Fumaria* L. (incl. *Discocapnos* Ch. et Schl. [S.W.] ) is represented in our area by the introduced *F. officinalis* L. The endemic genus *Trigonocarpus* Schlecht. is only known from the western region.

**Capparidaceae.**

The herbaceous South African genera of this order belonging to the sub-order *Cleomoideae* are absent in the Uit. and P. E. divs. They are only found in the eastern, north-eastern, and northern parts of South Africa. *Capparis* L., *Cadaba* Forsk, and *Maerua* Forsk are recorded. None of these reach far into the south-west coast region. The genus *Boscia* Lam. probably occurs on the eastern borders of our districts, but is not recorded.

**Cruciferae.**

Only the genera *Brassica* L., *Sinapis* L., *Heliophila* L., *Nasturtium* R. Br., *Sisymbrium* L., *Lepidium* L., *Capsella* DC. have been recorded from the Uit. and P. E. divs., and since, with the exception of *Heliophila*, these are either entirely or partly represented by introduced species, it will be seen that our area is very deficient in native species of *Cruciferae*, a feature which is characteristic for the whole of South Africa with the exception of the South-West, where the endemic genera, *Carponema* Sond., *Schlechteria* Bol., *Chamira* Thunb., *Palmstruckia* Sond., *Cycloptychis* E. Mey., *Brachycarpæa* DC., are found, also *Heliophila*, which is there enormously developed. In our area there are still thirteen species of *Heliophila*, but the genus thins out further east, four species being recorded from Natal. *Cardamine* L. is fairly common both east and west of our area. The occurrence of *Alyssum* L., *Barbaraea* R.Br. in the South-West, evidently native, is

noteworthy. Several genera, represented by introduced weeds such as *Coronopus* Gaertn. (*Senebiera* Poir.), *Rhaphanus* L., *Diplotaxis* DC. are sure to be found yet in our area. *Arabis* L. is recorded from near Graaff Reinet and the mountains of Natal, *Turritis* L. from the Witbergen, and *Matthiola* R. Br. from the eastern parts of the central region to Burghersdorp and the Caledon River.

**Resedaceae**

are absent in the Uit. and P. E. divs. They are only represented in South Africa by the genus *Oligomeris* Cambess., which extends from the Transvaal to the eastern parts of the Karroo and from Natal to the Fish River Randt.

**Moringaceae.**

*Moringa* Juss. occurs in Great Namaqualand.

## SARRACENIALES.

**Droseraceae.**

*Drosera* L. is found generally distributed in the southern and eastern parts, being absent from the drier interior parts. (*Roridula*, see under *Ochnaceae*).

## ROSALES.

**Podostomaceae.**

*Tristicha* Thouars. has been found in Calvinia div., Kingwilliamstown div., and in Natal (Pietermaritzburg), and *Sphaerothyl* Boschoff in Natal.

**Hydrostachydaceae.**

*Hydrostachys* Thouars. extends from the Tropics to Natal.

**Crassulaceae.**

Of the nine genera recognised by Harvey in the 'Flora Capensis,' ii, p. 328, I keep up only six (*Helophytum* E. & Z. and *Bulliarda* DC. being sunk in *Crassula* L. and *Bryophyllum* Salisb. in *Kalanchoe* And.). The south-western genus *Grammanthes* DC. is absent in the Uit. and P. E. divs. *Dinacria* Harv. extends from the Cape Peninsula through our districts to Grahamstown. *Rochea* DC., also an essentially south-western genus, has one species occurring on the Cockscomb Mts., and thus finds its eastern limit in our districts. *Kalanchoe* Adans., which radiates from the Tropics into South Africa without, however (except for a short distance near Norval's Pont) crossing the Orange River in the North, is represented by two species, one of which goes even further west as far as Riversdale. *Cotyledon* L. has a wide distribution all over South Africa. *Crassula* L., which is also universal in South Africa, is largely represented in our area. Several points

of interest come out when the distribution of the species is compared (which is also the case in numerous genera belonging to other orders), but this is beyond the scope of the present paper.

**Saxifragaceae.**

Of the three South African genera only the widely spread *Montinia* L. f. is recorded from the Uit. and P. E. divs. *Vahlia* Thunb., which has mainly a northern and north-western distribution, is absent, and so is *Choristylis* Harv. with an eastern distribution stopping short at the Katberg.

**Pittosporaceae.**

*Pittosporum* Banks extends from the eastern and north-eastern parts in the southern coast belt to George.

**Cunoniaceae.**

Both *Cunonia* L. and *Platylophus* Don are recorded from the Uit. or P. E. divs. The former is very widely spread in the coast districts of South Africa, while the latter does not reach the Cape Peninsula in the West and does not extend beyond Van Stadens Mountains in the East.

**Myrothamnaceae.**

*Myrothamnus* Welw. only occurs in the northern and north-eastern parts to Natal.

**Bruniaceae.**

This order is almost restricted to the south-west coast region. Three genera only extend to our districts—namely, *Berzelia* Brongn., *Brunia* L., and *Pseudobaeckia* T. Anders. A little further east, near Grahamstown, only one species of the first is still to be found. Curiously a species of *Raspalia* Brongn. occurs in East Pondoland and Natal. The order appears to be largely restricted to the Table Mountain sandstone, and this may account for the erratic distribution.

**Hamamelidaceae.**

*Trichocladus* Pers., the only South African genus now included in this order, is widely spread east of Uitenhage to the Tropics, and extends westwards to George.

**Rosaceae.**

Of the ten South African genera only *Alchemilla* L., *Rubus* L., and *Cliffortia* L., are recorded from the Uit. or P. E. divs. The two former have a very wide distribution, while *Cliffortia* is represented in the south-west coast region by a large number of species, thinning out rapidly beyond the Van Stadens River, though extending into Central Africa. Of the remain-

ing genera *Acaena* Vahl., *Grielum* L. have western and north-western distribution, *Potentilla* L. is only found on the Orange River, while all the others are eastern or north-eastern, though *Geum* L. is already found near Grahamstown, *Leucosidea* E. and Z. near Cathcart, and *Pygeum* Gaertn. at Fort Cuninghame.

**Leguminosae.**

Suborder **Mimosaceae.**

The genus *Acacia* only is recorded from the Uit. and P. E. divs. It radiates from tropical Africa into temperate South Africa. Two species are still found near Uitenhage, one of which extends also further west, but is only doubtfully native on the Cape Peninsula. All other genera are found in regions adjoining the Tropics, *Elephantorrhiza* Benth. penetrating to the Cradock district.

Suborder **Caesalpiniaceae.**

These have a similar distribution as the *Mimosaceae.* The genera *Cassia* L. and *Schotia* Jacq. are found in the Uit. div., neither of which appear to be recorded west of our districts; *Schotia speciosa* occurs, however, at Mossel Bay.

Suborder **Papilionaceae.**

These show to a certain extent a similar distribution to the two preceding suborders, and consequently there are a large number of genera only found in regions adjoining the Tropics or penetrating more or less in a south-westerly direction; but, in addition, there is a fairly large number of genera, some represented by an enormous number of species found in all South African floral regions, and, lastly, there are a number of endemic genera, especially in the south-west coast region, some of which are not even nearly related to tropical Africa genera. All genera distributed widely in South Africa are recorded from the Uit. and P. E. divs., some of them—*e. g. Lotononis* Benth., *Aspalathus* L., *Argyrolobium* E. and Z., *Psoralea* L., *Indigofera* L., *Lessertia* L., *Rhynchosia* Lour.—with more or less numerous species.

Amongst the genera which penetrate westward from Natal *Buchenroedera* E. and Z., *Eriosema* E. Mey., *Erythrina* L., and *Calpurnia* E. Mey. find their western limit in our districts. *Lotus* L., and *Dichilus* DC. penetrate to near their eastern borders and may yet be found in them, while *Crotalaria* L. and *Vigna* Lavi penetrate much further west, the former reaching the Cape Peninsula with one species.

Dealing now with the genera of essentially south-western distribution, we find that *Liparia* L., *Euchlora* E. and Z., *Walpersia* Harv., *Hypocalyptus* Thunb., *Loddigesia* Sims, *Viborgia* Thunb., *Fagelia* Neck. are absent.

*Cyclopia* Vent., *Priestleya* DC., *Borbonia* L., and *Virgilia* Lam. have their eastern limits in our districts. *Podalyria* Lam. extends to Natal; *Amphithalia* Thunb. extends to Cathcart; *Rafnia* E. and Z., and *Lebeckia* Thunb, extend beyond Grahamstown; *Hallia* Thunb. extends to the neighbourhood of Grahamstown.

The genus *Dumasia* DC. is not recorded, although it occurs both east and west—namely, at the Knysna and in the Pirie forest near Kingwilliamstown, in Natal and beyond.

## GERANIAALES.

### Geraniaceae.

The genus *Sarcocaulon* DC. with central, western, and north-western distribution is absent in the Uit. and P. E. divs., although it extends into the Fish River valley. *Erodium* L'Hér is introduced. *Monsonia* L., which is scattered over the greater part of South Africa, is represented by one species. Of *Geranium* L., represented by only few species in the southern coast districts, three species are recorded. The large number of recorded species of *Pelargonium* L'Hér. is only to be expected, as our districts form, in a sense, the centre of the distribution of the genus. The section *Hoarea* DC. does not extend east of the Uit. and P. E. divs. A useful summary of the distribution of the sections of the genus is given by R. Knuth in 'Pflanzenreich,' iv, 129, p. 37.

### Oxalidaceae.

*Oxalis* L., the only genus represented in South Africa, is found in the coast districts of South Africa, with its headquarters in the south-western region. Towards the East the number of species diminish. Few species penetrate towards the interior.

### Linaceae.

*Linum* L. is the only genus represented in South Africa. It is widely spread in the southern coast districts, going far inland in the eastern parts.

### Erythroxylaceae.

*Erythroxylon* P. Browne extends from the Tropics to the eastern and north-eastern parts, and along the east coast to East London.

### Zygophyllaceae.

*Tribulus* Tourn. is very widely spread in South Africa. *Zygophyllum* L. is absent from the eastern parts (my most eastern records are Port Alfred, Fort Brown, Burghersdorp), otherwise it is widely spread with its headquarters in the Karroo. All other South African genera are unrecorded in the Uit. and P. E. divs., namely, *Neoluederitzia* Schinz (Namaqualand), *Seetzenia* R. Br. (western), *Fagonia* Tourn. (western), *Sisyndite* E. Mey.

(north-western), and the Karroid genus *Augea* Thunb.; the latter, however, is almost sure to occur in the north-western parts of the Uitenhage division.

**Rutaceae.**

All arborescent South African genera are found in the Uit. and P. E. divs. *Calodendron* Thunb. occurs from Swellendam to Natal and beyond. *Clausena* Burm. (incl. *Myaris* Presl) appears to have its western limit near Port Elizabeth, while *Toddalia* Juss. and *Xanthoxylum* L. extend much further west.

Amongst the south-western genera *Empleuridium* Sond., *Adenandra* Bartl. et Wendl., *Phyllosoma* Bol., and *Euchaetis* Bartl. et Wendl. are absent. *Barosma* Willd. and *Agathosma* Willd. are well represented, but thin out further east, only the former reaching Natal. *Coleonema* Bartl. et Wendl. and *Empleurum* Soland. reach in our area their eastern limit. *Diosma* L. is still common near Grahamstown, but does not extend much further east, while *Acmadenia* Bartl. et Wendl. found in the Uit. div. is recorded by Ecklon and Zeyher and Drege from Kaffraria, though it appears to be absent from the intervening strip of country. The occurrence in the Uit. div. of the south-western genus *Macrostylis* Bartl. et Wendl. is doubtful, but in any case it does not extend further east.

**Simarubaceae.**

The endemic genus *Peglera* Bol. is found in the Kentani district. *Balanites* Del. occurs in extra-tropical Portuguese East Africa.

**Burseraceae.**

Only *Commiphora* Jacq. (*Balsamodendron* Kunth) extends to South Africa. It occurs in the north-western, northern, north-eastern and eastern parts, in the latter as far south as Kingwilliamstown.

**Meliaceae.**

*Ekebergia* Sparm. and *Ptaeroxylon* E. & Z. are found in the Uit. and P. E. divs. The former, according to Sonder, extends to George, but is more frequent east of our districts, while I have no record of *Ptaeroxylon* E. & Z. west of Uitenhage. *Nymania* Lindb. (*Aitonia* Thunb.) is a typical Karroo genus extending to Namaqualand and to the Uit. div. *Trichilia* L. and *Turraea* L. are eastern genera, the latter being found as far west as Port Alfred.

**Malpighiaceae.**

Four genera extend from the Tropics into the northern and north-eastern parts of South Africa, namely, *Acridocarpus* Guill. et Perr. (to Pondoland), *Sphedamnocarpus* Planch., *Triaspis* Burch. (to Kuruman), *Tristellateia* Thouars.

**Polygalaceae.**

The only South African genus not found in the Uit. and P. E. divs. is *Securidaca* L., which, however, is only found on the borders of the Tropics in the East. *Mundia* Kunth is a seashore plant extending from the West to the neighbourhood of East London. *Polygala* L. is generally distributed. *Muraltia* Neck. has its headquarters in the S.W. region, extending, however, to Natal and beyond to Nyassaland.

**Dichapetalaceae.**

*Dichapetalum* Thouars. (*Chailletia* DC.) is in South Africa restricted to the Transvaal and Bechuanaland.

**Euphorbiaceae** (excl. **Buxaceae**).

There are 42 genera recorded from South Africa, of which only *Euphorbia* L. is universally distributed. Arborescent forms of this genus are still common in the eastern parts of the Uit. and P. E. divs., and seem to have their western limit in the Humansdorp district near Hankey. The order radiates from the Tropics, especially from the North-East and East, gradually thinning out along the southern coast belt, but not penetrating far (apart from *Euphorbia*) into the central parts. Four genera are represented by native species on the Cape Peninsula. In the Uit. and P. E. there are 15, in Natal at least 22.

The following genera are endemic: *Lachnostylis* Turcz. (Swellendam to Port Elizabeth), *Heywoodia* Sim (coast forests of the Transkei and eastern Pondoland), *Toxicodendron* Thunb. (Little Namaqualand), *Seidelia* Baill. (Griqualand West).

The following extend from a north-eastern direction to the West of the Kei River (in addition to *Euphorbia* L.): *Andrachne* W. (Uitenhage, George), *Phyllanthus* L. (to Murraysburg and Uit. div.), *Croton* L. (to Uit. div.), *Jatropha* Thunb. (to Cookhouse and Uit. div.), *Cluytia* L. and *Leidesia* Mull. Arg. (along the coast belt to Cape Peninsula), *Acalypha* L. (to the Uit. div.), *Adenocline* Turcz. (to Hanover, Graaff Reinet, and along the coast belt to the Cape Peninsula), *Gelonium* L. (to P. E. div.), *Ctenomeria* Harv. (to Kei mouth and in the Uit. div.), *Excoecaria* L. (to the Pirie forest).

*Mercurialis* L. has become naturalised, one species occurring from the Uit. div. to Natal.

**Callitrichaceae.**

*Callitriche* L. has one native species in South Africa which is recorded from the Uit. div., the Albany div. and Natal. *C. verna* L. is recorded by Zaklbruckner from the Oliphants River, Clanwilliam.

## SAPINDALES (CELASTRALES).

### Buxaceae.

*Buxus* L. is represented by a native species in the coast forests from Alexandria to Pondoland. *Notobuxus* Oliv. occurs from the Transkei to Pondoland.

### Anacardiaceae.

The genus *Rhus* L. is generally distributed over South Africa where suitable conditions for its growth prevail. *Loxostylis* Spreng. f. extends from the western parts of the Uit. and P. E. divs. to Natal. *Laurophyllus* Thunb. extends from Van Stadens to Swellendam. *Harpephyllum* Burch. does not grow west of Uitenhage, and extends to Natal. The absence of *Heeria* Meisn. (*Anaphrenium* E. Mey.) is somewhat strange. It extends from the western, north-western and north-eastern parts to the Fish River valley near Grahamstown. The following are also absent: *Protorhus* Engl. (from the Pirie forest eastward), *Smodingium* E. Mey. (Transkei, Basutoland and Natal), *Sclerocarya* Hochst. and *Lannea* Rich. [*Odina* Rosb.] (both eastern and north-eastern).

### Aquifoliaceae.

The only South African genus *Ilex* L. occurs from the Cape Peninsula to Natal and beyond.

### Celastraceae.

Only *Gymnosporia* W. & A. is generally distributed, the remaining genera are mostly found in the coast belt from the Cape Peninsula to Natal. *Catha* Forsk. (*Methyscophyllum* E. & Z.), though not restricted to South Africa, is in South Africa only found in the Queenstown and Cathcart divs., *Pleurostylia* W. & A. extends from the Uit. and P. E. divs. to Natal, *Mystroxylon* E. & Z. from the Cape Peninsula to Natal and the Transvaal, *Hartogia* Thunb. (absent from continental tropical Africa, but found in Madagascar) from Riversdale to Uitenhage and Albany, *Elaeodendron* Jacq. from the Gauritz River to Natal and the Transvaal. The following are endemic: *Putterlickia* Endl. (Cape Peninsula, Uit. and P. E. divs. to Natal), *Pterocelastrus* Meisn. (Saldanha Bay to Natal and Transvaal), *Maurocenia* L. (restricted to S.W. Cape Colony), *Lauridia* E. & Z. (Cape Peninsula and from P. E. and Uit. divs. to Kentani, also in Damaraland), *Cassine* L. (Clanwilliam to Natal).

### Hippocrateaceae.

*Salacia* L. is found in Natal and the Transvaal, *Hippocratea* L. on the borders of the Tropics and at Kentani.

### Icacinaceae.

I have no record from the Uit. or P. E. divs. of *Cassinopsis* Sond.

*C. capensis* Sond. occurs according to Sim throughout the forest regions from Grootvadersbosch to Natal. The one species of *Apodytes* E. Mey. which extends throughout the forest regions of Cape Colony and Natal, but does not reach the Cape Peninsula, is found in the Uit. div.

**Sapindaceae.**

An essentially tropical order which, as defined by Radlkofer and others, is absent from the Cape Peninsula, and is represented by *Dodonaea* L. on the south-western and western mountains, in the Karroo, Namaqualand and Natal. *Allophylus* L. (*Schmidelia* L.) extends in the coast districts from the Knysna to Natal, *Smelophyllum* Radl. from Langekloof to Port Elizabeth. *Pappea* E. & Z. is found in the scrub of Uitenhage, Albany, and Namaqualand, one species is eastern. *Hippobromus* E. & Z. is found in the eastern scrubs and forests and does not seem to occur west of the Uit. div. *Cardiospermum* L. is eastern from the Kei River onwards, *Erythrophysa* E. Mey. is confined to Namaqualand. (For *Ptaeroxylon* E. & Z. and *Nymania* Lindb. [*Aitonia* Thunb.] see under *Meliaceae.*)

**Melianthaceae.**

There are three genera only: *Greyia* Hook. & Harv. and *Bersama* Fres. (*Natalia* Hochst.) are both eastern, the former confined to South Africa and found from Dohne and Komgha in the mountains to Barberton, the latter from Komgha eastwards. On the other hand, *Melianthus* L. has a decidedly western and central distribution. It is found on the Cape Peninsula, and in the east it does not appear to go beyond East London.

**Balsaminaceae.**

*Impatiens* L. is found on river banks in woods from George to Natal and the Transvaal. It has also been collected by Schlechter in the West on the Silver River, a locality unknown to me.

## RHAMNALES.

**Rhamnaceae.**

*Zizyphus* Juss., though pretty generally distributed in South Africa, has not been recorded in the Uit. and P. E. divs. It is also absent from the Cape Peninsula. *Scutia* Brongn. is found throughout the forest regions of Cape Colony and Natal and reaches the Cape Peninsula. *Rhamnus* L. has a similar distribution, but is also found in the Orange Free State and the Transvaal, but is absent from the Cape Peninsula. *Noltea* Reichb. f. occurs from the Cape Peninsula to Natal. *Helinus* E. Mey. is an eastern genus reaching its western limit on the Zuurberg. *Phylica* L., is, on the other hand, a typical south-western genus which almost stops at Port Elizabeth, only a few species being found further east as far as Natal. There remains only *Marlothia* Engl., which is only found in Bechuanaland.

**Vitaceae (Ampelidaceae).**

*Rhoicissus* Planch. (formerly placed under *Cissus* L. or *Vitis* Tourn.) is found in the southern coast districts of South Africa, one on the Cape Peninsula, chiefly in forests. *Cissus* L. is widely spread in South Africa, but absent from South-West Cape Colony.

## MALVALES.

**Tiliaceae.**

*Grewia* L. is fairly generally distributed in South Africa (absent, however, from the greater part of the Karroo), though only poor in species as compared with tropical Africa. *Sparmannia* L. has a well-known species at Stormsriver, George, Knysna, and in the Uit. div., and then occurs again from the Transkei eastwards, *Corchorus* L. and *Triumfetta* L. are essentially tropical genera, but extend into the parts of South Africa adjoining the Tropics, *Triumfetta* L. reaching the Kei mouth.

**Malvaceae.**

*Malva* L. is only represented by a common introduced weed. *Malvastrum* A. Gray is found in South Africa in the South-west and the Karroo and extends to Natal. *Sida* L., *Abutilon* Gaertn. and *Pavonia* L. radiate from the Tropics. I have no record of these genera west of the Uit. and P. E. divs. *Hibiscus* L. is generally distributed over South Africa. *Sphaeralcea* St. Hill. is confined to South Africa. It is found in the South-west, and then again in more eastern parts (Norval's Pont, Herschel district, Tembuland). *Althaea* L. is only known from near the mouth of the Orange River. The remaining five genera skirt the Tropics, *Cienfugosia* Cav. reaching Griqualand East and *Thespesia* Corr. Natal.

**Sterculiaceae.**

*Sterculia* L. is represented by one species near Uitenhage, famous on account of its complete isolation; the nearest spot where another species is found is the Lydenburg district, Transvaal. *Hermannia* L. (including *Mahernia* L.) is generally distributed in South Africa. *Melhania* Forsk. and *Dombeya* Forsk. have their western limit in the Uit. dis. *Cola* Schott. is found in Pondoland and Natal and *Waltheria* L. in Natal and the Transvaal.

## PARIETALES.

**Ochnaceae.**

*Ochna L.* is found in the forest regions from the Knysna to Natal and the Transvaal. No South African locality for *Sauvagesia* L., said to occur in temperate South Africa, is known to me. The remarkable endemic genus *Roridula* L. is restricted to a circumscribed area in South-west Cape Colony (mainly in the Caledon div.).

**Guttiferae** (incl. **Hypericineae**).

*Hypericum* L. is found from George eastwards to Natal and the Transvaal. The only other South African genus, *Garcinia* L., grows from the Transkei eastwards.

**Elatinaceae.**

*Bergia* L. occurs on the Cape Peninsula, at Riversdale, in the Uit. div. and then again in Bechuanaland, the Transvaal, and Portuguese East Africa.

**Frankeniaceae.**

Only the genus *Frankenia* L. is found in South Africa. It occurs on saline soil in the West, South-west, the Karroo, and near Kimberley, but in the coast districts it is not recorded east of Uitenhage.

**Tamaricaceae.**

*Tamarix* L. occurs in Namaqualand.

**Violaceae.**

*Hybanthus* Jacq. (*Ionidium* Vent.) found in the southern coast districts has approximately its western limit in the Uit. div. *Viola* L., apart from garden escapes, is only found in South-West Cape Colony and the Transvaal, while *Rinorea* Aubl. (*Alsodeia* Thouars.) penetrates from the Tropics into Natal and Pondoland.

**Flacourtiaceae.**

*Kiggelaria* L. and *Scolopia* Schreb. extend in the coast districts from the Cape Peninsula to the Tropics, *Doryalis* Arn. et. Mey. (incl. *Aberia* Hochst.) and *Trimeria* Harv. from George to the Tropics. Seven other genera penetrate into South Africa from the Tropics, but only *Xylosma* G. Forst. goes very far, namely to the Pirie forest, and *Rawsonia*, Harv. et. Sond. to the Transkei.

**Turneraceae.**

*Wormskioldia* Schum. et Thom. and *Piriqueta* Aulb. (formerly under *Turnera*) are found in South Africa in the parts skirting the Tropics. Both are found in the Transvaal but do not reach Natal.

**Passifloraceae.**

None of the South African genera are found wild in the Uit. and P. E. divs. They are only found in the parts of South Africa adjoining the Tropics. (See the next order, *Achariaceae.*)

**Achariaceae** (endemic in South Africa).

*Ceratosicyos* Nees and *Acharia* Thunb. are recorded from the Uit. and

P. E divs. The former extends from Port Elizabeth eastwards to Natal, the latter from Van Stadens to the Transkei. The third genus, *Guthriea* Bolus, is absent. It is only known from the Oudeberg near Graaff Reinet.

**Loasaceae.**

This order is represented in Africa only by the endemic genus *Kissenia* R. Br. found in the Western Region.

**Begoniaceae.**

*Begonia* L. is found in the East and North-East, extending to the mouth of the Kei River.

## OPUNTIALES.

**Cactaceae.**

The only native genus, *Rhipsalis* Gaertn., extends from the mouth of the S. John's River towards the Tropics. Several species of *Opuntia* Haw. are naturalised and are abundant in the south-eastern parts of the central region.

## MYRTIFLORAE.

**Geissolomaceae** (endemic in South Africa).

*Geissoloma* Lindl. et Kunth, the only genus, which, moreover, is monotypic, occurs only in the Swellendam and Riversdale divs.

**Penaeaceae** (endemic in South Africa).

The occurrence of the *Penaeaceae* with five species of *Penaea* L. in the Uit. and P. E. divs. is of great interest as they are restricted to the "south-west coast region." None of them are found east of the Uit. div. The four other genera are not found east of Swellendam.

**Oliniaceae.**

The only genus, *Olinia* Thunb., is represented in the Uit. and P. E. divs. by the widely-spread, very variable species which has served as the type for the genus. It extends from the Cape Peninsula through the coast districts to Natal, the Transvaal, and beyond.

**Thymelaeaceae.**

*Arthrosolen* C. A. Mey., *Passerina* L. (endemic), *Gnidia* L. and *Lasiosiphon* Fresen. have fairly general distribution in South Africa; the last is absent from the western region and the Cape Peninsula. *Chrymococca* Meisn. (endemic) is found at Simons Bay and in the Van Rhynsdorp div., *Cryptadenia* Meisn. (endemic) in the South-west, extending to the Cold Bokkeveld, but not reaching Swellendam, *Lachnaea* L. (endemic) in the South-west extending to the Cold Bokkeveld and eastwards to the P. E. div.,

*Struthiola* L. (endemic) in the South-west extending to the Ceres div. and along the southern coast belt to the Albany div. and appearing further in East Pondoland. *Dais* L. is found in the North-east and East southwards to Kingwilliamstown (outside South Africa it only occurs in Madagascar). *Englerodaphne* Gilg. is recorded from East London to Natal, *Synaptolepis* Oliv. from Delago Bay, *Peddiea* Harv. from the North-east and East (extends to Komgha).

**Lythraceae.**

This order radiates from tropical Africa into South Africa. Of the six South African genera only *Lythrum* L. gets anywhere near to the south-west coast region, and this only by a widely spread species which is recorded from the Uit. and P. E. divs.

**Rhizophoraceae.**

*Rhizophora* L. and *Bruguiera* Lam. occur on the coast from the Transkei northwards; *Weihea* Spreng. in the coastwards forests of the East, extending to the Amatolas near Kingwilliamstown; *Cassipourea* Aubl. in East Pondoland and Natal.

**Combretaceae.**

Only *Combretum* L. reaches our districts from the East in one species which does not seem to extend beyond Van Stadens. *Quisqualis* L. and *Terminalia* L. skirt the Tropics, but do not reach Natal.

**Myrtaceae.**

Two species of *Eugenia* L. are recorded from the Uit. and P.E. divs. This genus does not seem to occur west of Van Stadens. *Metrosideros* R. Br. (south-western), *Sizygium* Gaertn., and *Heteropyxis* Harv. (both eastern) are absent.

**Melastomaceae.**

This order penetrates from the Tropics: *Memecylon* L. to Natal, *Dissotis* Benth. (incl. *Argyrella* Naud.) and *Osbeckia* L. to East Pondoland.

**Oenotheraceae.**

Only the genera *Oenothera* Spach. and *Epilobium* L. are recorded from the Uit. and P. E. divs. The former is introduced. The remaining three South African genera are eastern and are found in Natal and beyond, only *Ludwigia* L. comes as close as Kingwilliamstown. (*Montinia*, see under **Saxifragaceae**.)

**Halorrhagidaceae.**

*Gunnera* L., *Laurembergia* Berg. (*Serpicula* L.), and *Myriophyllum* L. are recorded from the Uit. and P.E. divs. The last does not seem to occur

west of the Uit. div., and does not occur in the Albany and Bathurst divs. The two former are widely spread in the coast districts of South Africa. *Gunnera* also occurs in the North-East, and *Myriophyllum* in the system of the Orange River.

### UMBELLIFLORAE.

**Araliaceae.**

The only South African genus, *Cussonia* Thunb., is recorded from the Uit. and P. E. divs. It is very widely spread though thinning out westwards, only one species reaching the Cape Peninsula.

**Umbelliferae.**

The majority of South African genera have been recorded from the Uit. and P. E. divs. The exceptions (leaving out obvious garden escapes) are *Sanicula* L. and *Ptychotis* Koch (excl. *Trachyspermum* Link.), both with wide distribution east and west of Uitenhage; *Oenanthe* L., *Levisticum* Koch, and *Ruthea* Bolle (*Glia* Sond.), all found only in the south-western coast region; *Choritaenia* Benth. et Hook (*Pappea* Sond. et Harv.), with northern distribution; *Polemannia* E. and Z., with northern and eastern distribution as far as the Katberg. Of the recorded ones, *Hermas* L., *Capnophyllum* Gaertn., and *Trachyspermum* Koch are south-western and do not extend in an eastern direction, while *Arctopus* L. and *Annesorhiza* Clam. et Schl. (incl. *Stenosemis* E. Mey.) with similar distribution reach the Albany district. *Pimpinella* L. with eastern distribution does not go further west, while *Heteromorpha* Ch. et. Schl. extends to George. *Rhyticarpus* Sond., with northern distribution, is also found north of Grahamstown. *Pituranthos* Viv. (*Deverra* DC.), with central, northern, and western distribution, reaches neither Natal nor the Cape Peninsula. The other genera have more or less general distribution in the southern and south-eastern coast belt.

**Cornaceae.**

The genus *Curtisia* Ait. is reported from the Zuurberg. It is found in all forest regions in South Africa, extending even to the Cape Peninsula. The genus *Cornus* L. is recorded from Natal, and does not extend westwards.

## METACHLAMYDEAE (Sympetalae).

### ERICALES.

**Ericaceae.**

*Erica* L. is represented in the Uit. and P. E. divs. by twenty-eight species, many of which are only recorded from Van Stadens. East of Uit. div. the number is very much smaller. *Blaeria* L., *Thoracosperma* Kl., *Anomalan-*

*thus* Kl., and *Simocheilus* Kl., which are distributed in the south-western coast region, have their eastern limit in our districts. Fifteen genera found in the south-western coast region are absent. *Coilostigma* Kl. and *Thamnus* Kl. are recorded. The former extends from Riversdale div. to the Albany div.; the latter is only known from Van Stadens and the Humansdorp div. *Ericinella* Klotzsch is only known from the Graaff Reinet, Cathcart, and Queenstown divs. *Vaccinium* L. (frequently placed in a separate order, *Vacciniaceae*) is absent. In South Africa it is only known from Barberton.

## PRIMULALES.

### Myrsinaceae.

*Myrsine* L. is widely spread in the coast districts of South Africa. *Maesa* Forsk. extends from the Stockenstroom div. eastwards, and *Embelia* Burm. eastwards from the Komgha div.

### Primulaceae.

*Lysimachia* L. is not found west of Uitenhage, and is even further east very local in its distribution. *Samolus* L. is found all over South Africa, where it has suitable conditions for its growth. *Anagallis* L. is absent from the Karroo and the western region. The only species recorded occurs in South Africa as a garden weed only.

### Plumbaginaceae.

*Statice* Willd. is found in the western and south-western region, penetrating only slightly into the Karroo. Along the coast it is found as far as the Kentani district. It is absent from Natal. *Plumbago* L. has its western limit in the Uit. div., while *Vogelia* Lam. is, in South Africa, chiefly confined to the western region penetrating into Calvinia.

## EBENALES.

### Sapotaceae,

*Sideroxylon* L. is found in the coast districts from the Cape Peninsula eastwards to Delagoa Bay and the Transvaal. *Chrysophyllum* L. is confined to the Transvaal and Natal. *Mimusops* L. extends from the Transvaal and Natal along the coast to the Olifantshoek close to the eastern border of the Uit. div.

### Ebenaceae.

*Royena* L. and *Euclea* Murr. are generally distributed. *Maba* J. R. and G. Forst. occurs on the coast from East London to Natal. *Diospyros* L. is only found on the borders of the Tropics.

## CONTORTAE.

### Oleaceae.

*Jasminum* L. is widely spread in the southern coast districts, and extends to the Orange Free State and the Transvaal, but does not reach the Cape Peninsula in the West. *Olea* L. has a similar distribution, but extends further into the interior, and is found on the Cape Peninsula. *Schrebera* Rosb. is confined to the Transvaal; while *Menodora* Humb. et Bonpl. is found in Little Namaqualand, Griqualand West, Bechuanaland, the Transvaal and Natal.

### alvadoraceae.

*Azima* Lam. is widely spread in the southern coast districts of South Africa, but does not reach the Cape Peninsula. The only other South African genus, *Salvadora* Garcin., enters South Africa only near Delagoa Bay.

### Loganiaceae.

*Gomphostigma* Turcz. has only been found in the Uit. div. on its eastern boundary. It is absent from the coast districts westwards; otherwise it is widely spread in South Africa, especially in the eastern and north-eastern parts. *Nuxia* Lam. is absent from the Karroo and the coast districts west of George; otherwise it is also widely spread. *Chilianthus* Burch. and *Buddleia* L. are more widely spread, but absent from the Cape Peninsula. *Strychnos* L. has its western limit in our area, and extends in the coast districts to Delagoa Bay and is also found in the Transvaal. *Retzia* Thunb., placed by some botanists under *Solanaceae*, is only found in a restricted area in South-West Cape Colony.

### Gentianaceae.

The large genera *Sebaea* R, Br. and *Chironia* L. are practically absent from the Karroo; otherwise they are generally spread over South Africa. The monotypic genus *Lagenias* R. Br., which is sometimes kept separate from *Sebaea*, is confined to West and South-West Cape Colony. *Belmontia* E. Mey. (incl. *Exochaenium* Griseb.) is confined to the Kalahari and the south-eastern region from the Kei mouth onwards. *Orphium* L. is only found in South-West Cape Colony as far as Riversdale. *Enicostemma* Blume is restricted to the North-East, skirting the Tropics. *Faroa* Welw. is only found in Basutoland; *Swertia* L. in the Orange Free State and the Transvaal. Then there are two genera confined to marshy ground. *Villarsia* Vent. grows in the coast districts from the Cape Peninsula to the Uit. div., while *Limnanthemum* S. M. Gmel. extends from the Cape Peninsula through the coast districts to Natal and the Transvaal.

### Apocynaceae.

Of the thirteen genera known from South Africa, *Gonioma* E. Mey. is

entirely restricted to forests from George to East London. All the others are outliers from the Tropics. *Carissa* L. extends westwards to Swellendam; *Acokanthera* G. Don. to George. They are absent from the Karroo. *Pachypodium* Lindl. extends into the Eastern Karroo, and in the coast districts is not recorded west of Uitenhage. The remaining genera do not occur west of the Kei River, with the exception of *Strophanthus* DC., which extends t the Kagaberg, near Bedford.

**Asclepiadaceae.**

(1) Periploceae. *Ectadium* E. Mey. is endemic in Namaqualand. None of the other five South African genera extend further from the Tropics than the Kei River, with the exception of *Raphionacme* Harv., which is found as far as the Uit. div.

(2) Secamoneae. *Secamone* R. Br. extends from the Tropics in the coast districts ; one species reaches the Cape Peninsula.

(3) Cynancheae. Of these only *Cynanchum* L. and *Stapelia* L. are found in all South African regions and extend into the Tropics, *Huernia* R. Br. in all except the extreme S.W. No less than eighteen genera are endemic in South Africa, namely, *Microloma* R. Br. (W., S.W. to Port Elizabeth, Karroo and Bechuanaland), *Parapodium* E. Mey. (Kalahari region to Eastern Karroo and Queenstown), *Woodia* Schlecht (E. and N.E. to Somerset East and Humansdorp), *Periglossum* Decne. (E. and N.E. to Komgha), *Cordylogyne* R. Br. (N.E. and E. to Graaff Reinet and Queenstown), *Krebsia* Harv. (N.E. and E. to Aliwal North and Fort Beaufort), *Fanninia* (Natal to Cathcart), *Glossostephanus* E. Mey. (S.W. to Van Stadens), *Eustegia* R. Br. (W. and S.W. to the Paarl), *Emicocarpus* K. Schum. & Schlecht. (Delagoa Bay), *Emplectanthus* N. E. Br. (Natal and Zululand), *Rhyssolobium* E. Mey. (Little Namaqualand), *Sisyranthus* E. Mey. (Natal, Griqualand East to the Winterberg, Albany and Bathurst), *Macropetalum* Burch. (Kalahari region), *Anisotoma* Fenzl. (Drakensberg to Van Stadens), *Pectinaria* Haw. (West and Karroo to Bedford), *Diplocyatha* N. E. Br. (Western Karroo), *Piaranthus* R. Br. (West and Karroo to Bedford). The remaining genera are represented in the Tropics. Their distribution in South Africa is as follows: *Xysmalobium* R. Br. (in all South African regions except the West, Cape Peninsula, Western Karroo), *Schizoglossum* E. Mey. and *Asclepias* L. (mostly E. and N.E., penetrating into the Eastern Karroo and along the coast to the Cape Peninsula), *Pachycarpus* E. Mey. (mostly E. and N.E., extending in the coast districts to Swellendam), *Pentarrhinum* E. Mey. (fairly general, but in the southern coast districts, not west of Uit. div.), *Sarcostemma* R. Br. (similar, but not west of Mossel Bay), *Pergularia* L. (N. and N.E.), *Tylophora* R. Br. (W., N., N.E. and E., not west of Uit. div. in the southern coast districts, penetrating slightly into the Karroo), *Sphaerocodon* Benth. (E. and N.E.),

*Marsdenia* R. Br. (E., penetrating westwards to the Cradock and Uit. div.), *Fockea* Endl. (Karroo, E. and N.E., one species in the South as far as Mossel Bay), *Gymnema* R. Br. (E., N. and N.E.), *Orthanthera* Wright (W. and Kalahari region), *Tenaris* E. Mey. (N.E., one species in Albany, Bathurst and at Addo), *Riocreuxia* DC. (N., N.E. and E., extending westwards to the Karroo and George, but not recorded from our area), *Ceropegia* L. (N., N.E. and E. to the Uit. div. and Eastern Karroo), *Brachystelma* R. Br. (mainly N.E. and E. to Uit. div., few in Eastern Karroo, W. and S.W.), *Caralluma* R. Br. (W., as far as Malmesbury and Ceres, Western Karroo, Kalahari region), *Trichocaulon* N. E. Br. and *Hoodia* Sweet (W. and Karroo), *Tavaresia* Welw. (W. and Upper Karroo), *Huerniopsis* N. E. Br. (Griqualand East and Bechuanaland), *Duvalia* Haw. (W. and Karroo to Albany and Uit. div.).

## TUBIFLORAE.

### Convolvulaceae.

*Ipomaea* L. is mainly north-eastern and eastern, extending westwards in the coast districts, but only few species are found west of the Uit. div., none reaching the Cape Peninsula. *Convolvulus* L. is found in all South African regions, but is almost absent in the West, and there is no native species on the Cape Peninsula. *Falkia* L. is found in the southern coast regions, also in the East and North-East. *Cuscuta* L. has a similar distribution. *Dichondra* Forst. is found in the coast districts from the Cape Peninsula to Natal. Then there are four genera only found in the East and North-East, of these *Breweria* R. Br. extends to Queenstown, and lastly one genus is only recorded from Natal and Delagoa Bay.

### Hydrophyllaceae.

The only South African genus, *Codon* L., is found in the western region extending to the Ceres div.

### Borraginaceae.

The following are found in all regions with the exceptions noted *Heliotropium* L. (absent from south-east coast region), *Cynoglossum* L. (absent from Western Karroo and western region), *Echinospermum* L. (absent from West and extreme South-West), *Myosotis* L. (absent from West, including Cape Peninsula), *Lithospermum* L. (absent from Cape Peninsula, except an evidently introduced species). *Cordia* L. is eastern, but extends to the Uit. div. and a considerable distance into the Karroo. *Tournefortia* L. has central, western, and northern distribution. *Trichodesma* R. Br. has northern, north-eastern, central, and western distribution, extending to the Ceres division. *Tysonia* Bolus is confined to Griqualand East. *Anchusa* L. is found in the Karroo (extending to Queenstown and neighbourhood of

Grahamstown) and in the West and South-West (not on the Cape Peninsula), *Lobostemon* Lehm. is mostly confined to the South-West, but also found in the West and the Karroo (extending to the Uit. and Albany divs.). The only native species of *Echium* L. is found in the Stellenbosch div.

**Verbenaceae.**

*Bouchea* Cham. is represented in all South African regions. Four (or five) genera are endemic in the south-west coast region, of these only *Stilbe* Berg. extends to the Uit. div. The remaining genera have a decided eastern and north-eastern distribution. Of these *Lippia* L. extends westwards to Grahamstown, *Priva* Adans. to our area, *Vitex* L. to Komgha, *Clerodendron* L. to Port Alfred, *Avicennia* L. to Peddie. *Duranta* L. (at least in the native state) does not come near our area, *Lantana* L. is absent in the West and South-West (except one introduced species). The species of *Verbena* L. found in various parts of South Africa are all introduced.

**Labiatae.**

Genera of more or less general distribution in South Africa: *Mentha* L., *Salvia* L., *Stachys* L., *Acrotoma* Benth. (absent from southern coast districts), *Leonotis* R. Br., and *Teucrium* L. (absent from the West). Sixteen genera have an essentially eastern and north-eastern distribution. Of these the following penetrate, mostly in the coast districts, a variable distance westwards: *Becium* Lindl. (to Uit. div.), *Ocimum* L. (to Komgha), *Orthosiphon* Benth. (to the Pirie bush or even to Albany [?]), *Syncolostemon* E. Mey. (to East London), *Plectranthus* L'Herit. (to Caledon), *Coleus* Lour. (to the Peddie div.). *Aeolanthus* Mart. (to Graaff Reinet), *Micromeria* Benth. (to Queenstown), *Leucas* Burm. (to the Uit. div.), *Lasiocorys* Benth. (to the Uit. and Jansenville divs.), *Ajuga* L. (to the Uit. and Somerset East divs.). Two genera are only found in the north-eastern parts, *Ballota* L. in the western, south-western, and central parts (to Queenstown). *Cedronella* Moench. (South-west) and *Marrubium* L. (Table Mt. and Addo) are introduced.

**Solanaceae.**

*Solanum* L., *Withania* Pauq., and *Lycium* L. are found in all South African regions, the last especially in the drier parts, *Physalis* L. (with the exception of one Natal species?), *Nicandra* Adans., *Datura* L., *Nicotiana* L., and *Cestrum* L., are introduced, but have become naturalised in numerous places. (For *Retzia* Thunb., see under *Loganiaceae*.)

**Scrophulariaceae.**

Twenty-one genera have a very wide distribution in South Africa. Of these only *Teedia* Burch. and *Bellardia* All. are not recorded from the Uit. and P. E. divs., *Mimulus* L. and *Striga* Lour. (common in th

Albany distr.), are absent from the south-west coast region, *Polycarena* Benth., *Peliostomum* Endl., *Hemimeris* L. f. are not found east of Uitenhage in the coast regions, *Hyobanche* Thunb. is absent in the Kalahari region, *Ilysanthes* Rafin. is absent from the central and western region. Seven genera have eastern distribution and do not reach our districts. The four following are mainly eastern and north-eastern: *Sopubia* Hamilt. (to the Knysna), *Bopusia* Presl. (to Riversdale), *Buchnera* L. (to the Paarl), *Cycnium* E. Mey. (extends west of Uitenhage), *Ramphicarpa* Benth. (to George). Three genera are south-western, of which *Freylinia* Spin. finds its eastern limit near Port Elizabeth, Three genera are only found in the Kalahari region, two only in the western region. There remain only the following (leaving out three genera which must be looked upon as garden escapes): *Aptosimum* Burch. (recorded from the foot of the Winterhoek Mts., central and western regions and Kalahari) and *Alonsoa* R. & P. which has only so far been found by Zeyher near Uitenhage.

Tribe **Selagineae.**

*Hebenstreitia* L., *Walafrida* E. Mey. (poorly developed in the West and South-West) and *Selago* L. (mostly in the South-West) are found in all South African regions. *Dischisma* Choisy is confined to the West and South-West, extending to Port Elizabeth, *Microdon* Choisy, *Gosela* Choisy, and *Agathelpis* Choisy to the South-West.

**Bignoniaceae.**

*Tecomaria* Spach extends from Uitenhage to the Tropics in the south-eastern coast belt. *Podrane* Sprague is confined to Pondoland. *Rhigozum* Burch. extends from the northern parts through the Karroo to the Keiskamma, Uitenhage, and George. *Catophractes* D. Don has western and north-eastern distribution. *Kigelia* DC. extends from Delagoa Bay to the Pirie forest in rather isolated spots.

**Pedalinaceae.**

This order has chiefly northern and north-eastern distribution in the so-called Kalahari region. Only *Ceratotheca* Endl. and *Sesamum* L. extend to Natal and the former also to Pondoland, while the latter also extends to the Richmond and Somerset East divs. The endemic genus *Holubia* Oliv. occurs in the Transvaal, *Rogeria* J. Gray inhabits the western region and extends to the Kalahari region. The southern limits of the remaining genera are as follows: *Pterodiscus* Hook, and *Pretrea* J. Gay extend to Griqualand West, *Harpagophytum* DC. to Hopetown.

**Orobanchaceae.**

Only the genus *Orobanche* Tournef. (including *Philipaea* E. Mey.) is

found in South Africa and represented in the south-west coast region. It has not been recorded from the Uit. and P. E. divs.

**Gesneriaceae.**

The only South African genus, *Streptocarpus* Lindl., is mainly distributed in the eastern and north-eastern parts, and extends in the coast districts to the Knysna.

**Lentibulariaceae.**

*Utricularia* L. is found in the East and North-east extending in the coast districts to the Cape Peninsula and inland to Graaff Reinet. The only other South African genus, *Genlisea*, A. St. Hil. is only found in the East and North-East.

**Acanthaceae.**

*Blepharis* Juss. and *Monechma* Hochst. are found in all South African regions except in the extreme South-West; *Barleria* L. has a similar distribution, but is also absent from the West Karroo. Ten genera come across the border of the Tropics but do not penetrate very far in South Africa. One genus is endemic in the Kalahari, and one, *Chaetacanthus* N. ab E., is endemic in the north-eastern and eastern parts but extends in the coast districts to Mossel Bay. The following also extend from the Tropics into eastern and south-eastern parts of South Africa, but have a considerable western extension in the coast districts: *Thunbergia* L. (one species to Mossel Bay), *Ruellia* L. (one to Swellendam) *Sclerochiton* Harv. (one to Somerset East), *Crabbea* Harv. (extends to the Uit. div.), *Asystasia* Blume (one said to come from Koonap heights near Grahamstown and one has been found at Ceres), *Justicia* L. (few go west of Uitenhage), *Siphonoglossa* Oerst. (to Alexandria div.), *Isoglossa* Vent. and *Peristrophe* Nees (not recorded west of the Uit. div.), *Hypoestes* R. Br. (to Caledon), *Dicliptera* Juss. (to Cape Peninsula).

**Myoporaceae.**

The endemic genus *Oftia* Adans. occurs in the western and south-western region as far as Riversdale.

## PLANTAGINALES.

**Plantaginaceae.**

Only the genus *Plantago* L. is found in South Africa. It occurs in the southern coast districts (penetrating to Graaff Reinet) and in the eastern and north-eastern parts.

## RUBIALES.

**Rubiaceae.**

Seven genera are only found on the borders of the Tropics. There are

eleven genera found in the eastern and north-eastern parts which do not go west of the Kei: *Alberta* (to Pondoland), *Cephalantha* L., *Pachystigma* Hochst. (*Fadogia* Schweinf.), *Richardsonica* L., *Mitracarpus* Zucc., *Tarenna* Gaertn. (*Webera* Schreb.), *Oxyanthus* DC. (to Port St. John's), *Tricalysia* A. Rich. (incl. *Bunburya* Meisn., *Diplospora* DC., and *Kraussia* Harv. to Pondoland), *Pentas* Benth. The following are also eastern and north-eastern but go much further west: *Pentanisia* Harv. (to the Winterberg and Port Alfred), *Plectronia* L. (*Canthium* Lam., to the Cape Peninsula). *Vangueria* Juss. (to the Uit. div.), *Pavetta* L. (to Port Elizabeth), *Rubia* L. (to the Gamtoos River valley, Oudtshoorn, and Boschberg), *Hydrophylax* L. (to the Zitzikamma), *Barresia* G. W. Mey. (sub-*Spermacoce* Dill., to Grahamstown), *Galopina* Thunb. (to Swellendam), *Psychotria* L. (to the Uit. div.), *Gardenia* E. Mey. (to Swellendam), *Burchellia* R. Br. (to Swellendam), *Randia* Hochst. (*Stylocoryne*, Cavan., *Mitrostigma* Hochst., to the Uit. div.). The following have more restricted distribution: *Carpococe* Sond. (Cape Peninsula to Uitenhage and Grahamstown), *Nenax* Gaertn, (*Ambraria* Cruse, South-West, and again one species at Port Alfred and East London), *Crocyllis* E. Mey. (Namaqualand). Fairly generally distributed are only *Galium* Tourn., *Anthospermum* L., and *Oldenlandia* Plum. (incl. *Hedyotis* L.).

The following genera are *endemic* in South Africa: *Carpococe* Sond., *Nenax* Gaertn., *Galopina* Thunb., *Crocyllis* E. Mey., and *Burchellia*, R. Br.

**Valerianaceae.**

*Valeriana* L. is found in the coast districts from the Cape Peninsula to Natal, also on the eastern mountains. *Valerianella* Poll. appears to be only known from Zuurbrak and the Grootvadersbosch.

**Dipsacaceae.**

*Cephalaria* Schrad. and *Scabiosa* L. are eastern and north-eastern and extend in the coast districts to the Cape Peninsula.

## CAMPANULATAE.

**Cucurbitaceae.**

Of the 17 South African genera most are found in the parts adjoining the Tropics. The genera *Melothria* Cogn. (incl. *Mukia*, Arn. and *Zehneria* Endl.), *Coccinia* Wight et Arn. (*Cephalandra* Schrad.). *Cucumis* L., and *Kedrostis* Cogn. (incl. *Coniandra* and *Rhynchocarpa*) are recorded from the Uit. and P. E. divs. Few species are found west of the Uit. div., only 3 or 4 reaching the Cape Peninsula.

**Campanulaceae.**

*Grammatotheca* Presl. (endemic), *Monopsis* Salisb. (incl. *Dobrowskya* Presl. and *Parastranthus* Don), *Lobelia* L. (incl. *Isolobus* DC. and *Metzleria*

Presl), *Cyphia* Berg., *Wahlenbergia* Schrad. and *Lightfootia* L'Her. are common in the coastal belt from Clanwilliam to Natal and in the eastern mountains, but are poorly represented in the Karroo and the Kalahari region proper. *Laurentia* Neck. (incl. *Enchysia* Presl.) is chiefly found in the South-West, but one species occurs near Grahamstown and one still further east. *Prismatocarpus* L'Her. (endemic) is essentially south-western, but extends to Grahamstown. *Roëlla* L. (endemic), also mostly south-western, occurs as far as the Uit. div. and then again from East London to Natal. The following south-western genera (all endemic) do not reach the Uit. and P. E. divs.: *Microcodon* A. DC., *Siphocodon* Turcz, *Rhigiophyllum* Hochst., *Merciera* A. DC. and *Treichelia* Vatke (*Leptocodon* Sond.). *Cephalostigma* A. D.C. enters temperate South Africa in the extreme North-West, *Sphenoclea* Gaertn. in the North East.

**Goodeniaceae.**

The only South African genus, *Scaevola* L., represented by a single species inhabiting the sand on the seashore, is recorded from the Uit. and P. E. divs. and extends both East and West, in the latter direction as far as Mossel Bay.

**Compositae.**

The enormous number of South African genera of *Compositae* can be arranged in several groups more or less well defined as regards their distribution.

1. Over 40 genera with more or less general distribution (some restricted to the southern coast districts and some not reaching to the Cape Peninsula). Of these *Dicrocephala* DC. and *Chrysanthemum* L. are not found in the Uit. and P. E. divs.

2. About 20 genera, radiating from the Transvaal and Natal chiefly along the southern coast districts. Most of these do not come near our districts. *Tanacetum* L. stops at Bedford and East London, *Schistostephium* L. in the Albany district. *Artemisia* L., which extends to Genadendal, is not recorded. *Vernonia* Schreb. and *Stephanocoma* Less. extend much further west, while *Mikania* Willd. has its western limit at Van Stadens and *Launea* Cass. (*Microrhynchus* Less.) at Coega.

3. Over 40 genera are mainly found in the south-west coast region, some with very local distribution. Of these about 28 do not reach our districts. *Oedera* L. and *Landtia* L. are not recorded though occurring further east, namely near Grahamstown. Amongst the recorded ones *Corymbium* L. *Disparago* Gaertn., *Helipterum* DC., *Oldenburgia*, Less., reach the neighbourhood of Grahamstown. *Elytropappus* DC., though common near Grahamstown, is introduced, and probably also reached the Uitenhage district through the agency of man; *Heterolepis* Cass., *Cullumia*, R. Br., have their eastern limits in our districts, *Gorteria*, L. at Hankey.

4. Genera with essentially central and south-western distribution. There are about 9 of these, of which the following are recorded: *Chrysocoma* Cass., *Adenachaena* DC., *Eriocephalus* L., all of which extend to the neighbourhood of Grahamstown, while *Doria* Less. and *Didelta* L'Her. find their eastern limit in our districts.

5. A few genera are found in the central region and in our districts namely, *Phymaspermum* Cass., *Amphiglossa* DC., and *Nestlera* Spreng.

6. Genera with very restricted distribution and not included in 2–5. Of these the following require mention: *Cypselodontia* DC. (only found by Ecklon in the Uitenhage district), *Anaglypha* DC. (only found by Drege between Coega and the Zwartkops river), *Platycarpha* Less. (Uitenhage and Natal), *Adenosolen* DC. (Uitenhage, very incompletely known; described from Ecklon's specimens), *Amphidoxa* DC. (Uitenhage, Port Elizabeth, Grahamstown, Western Transvaal).

There remain 6 genera with western distribution, 3 genera confined to the central region and a few genera with very local distribution in other parts.